(12) UK Patent Application (19) GB (11) 2 375 407 (13) A

(43) Date of A Publication 13.11.2002

(21) Application No 0111244.0

(22) Date of Filing 09.05.2001

(71) Applicant(s)
Fujitsu Services Limited
(Incorporated in the United Kingdom)
26 Finsbury Square, LONDON, EC2A 1SL,
United Kingdom

(72) Inventor(s)
Christopher John Stokes
Roy James Bunyan
Richard Trevor Allen
Graham Tull

(74) Agent and/or Address for Service
Fujitsu Services Limited
Observatory House, Windsor Road, SLOUGH,
Berkshire, SL1 2EY, United Kingdom

(51) INT CL[7]
G06F 17/60

(52) UK CL (Edition T)
G4A AUXF

(56) Documents Cited
EP 0676708 A
WO 1996/030288 A1
JP 2000247415 A
US 4796209 A

(58) Field of Search
UK CL (Edition T) G4A AUDB AUXF AUXX
INT CL[7] G06F
ONLINE:WPI,PAJ,EPODOC

(54) Abstract Title
Stock location management system

(57) The stock location management system, for use in warehouses and stores to aid order picking by both staff and customers, comprises a number of zones where stock can be located, each zone having at least one respective identification indicator 1 associated therewith, and the stock which includes a number of product lines, each of which has a respective identification indicator 3 associated therewith. Means 16 are provided for reading the zone identification indicators and the product identification indicators and a first storage means 14 is provided for storing information regarding which product line is stored in which zone. Means are included whereby the physical location of each zone can be determined and a second storage means 15 is provided for storing the physical location information. The system preferably includes means 13 for finding the physical location of a product line by interrogation of the first storage means to determine the respective zone or zones for the product line followed by subsequent interrogation of the second storage means to determine the physical location of said zone(s). The information held in the storage means can preferably be updated to reflect changes in product line, layout etc. through the use of e.g. bar code readers, radio tags etc. Also disclosed is a method for use in the management of stock.

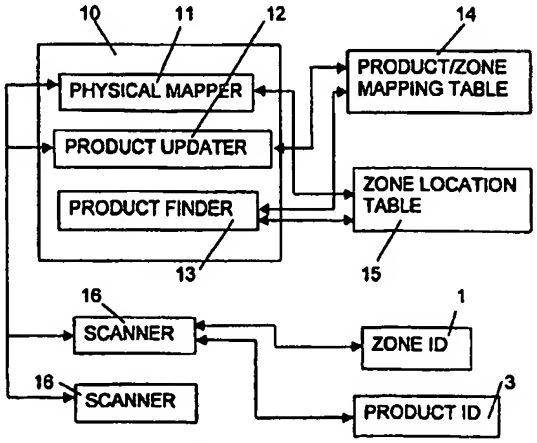

FIG 2

GB 2 375 407 A

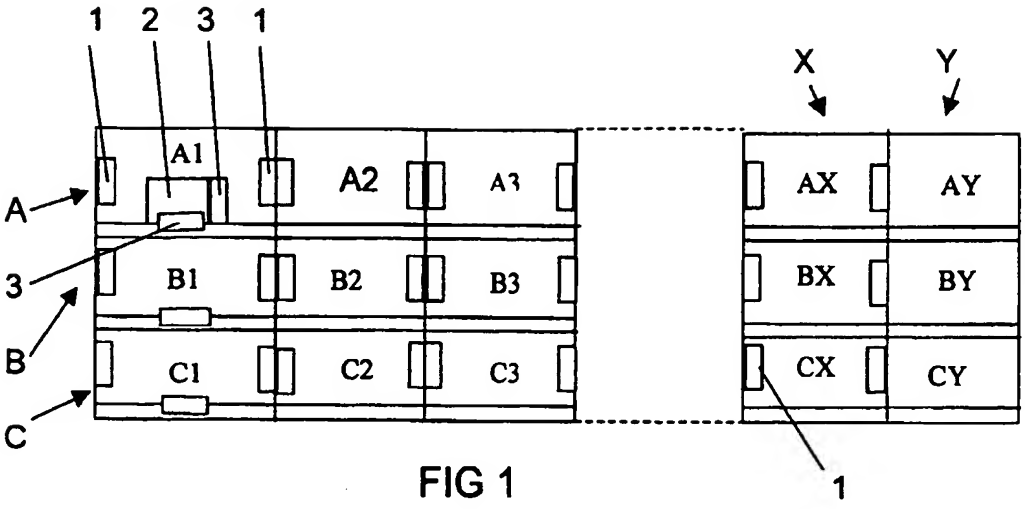
1
2
3
1
X
Y
A1
A2
A3
AX
AY
A
3
B1
B2
B3
BX
BY
B
C1
C2
C3
CX
CY
C
1

FIG 1

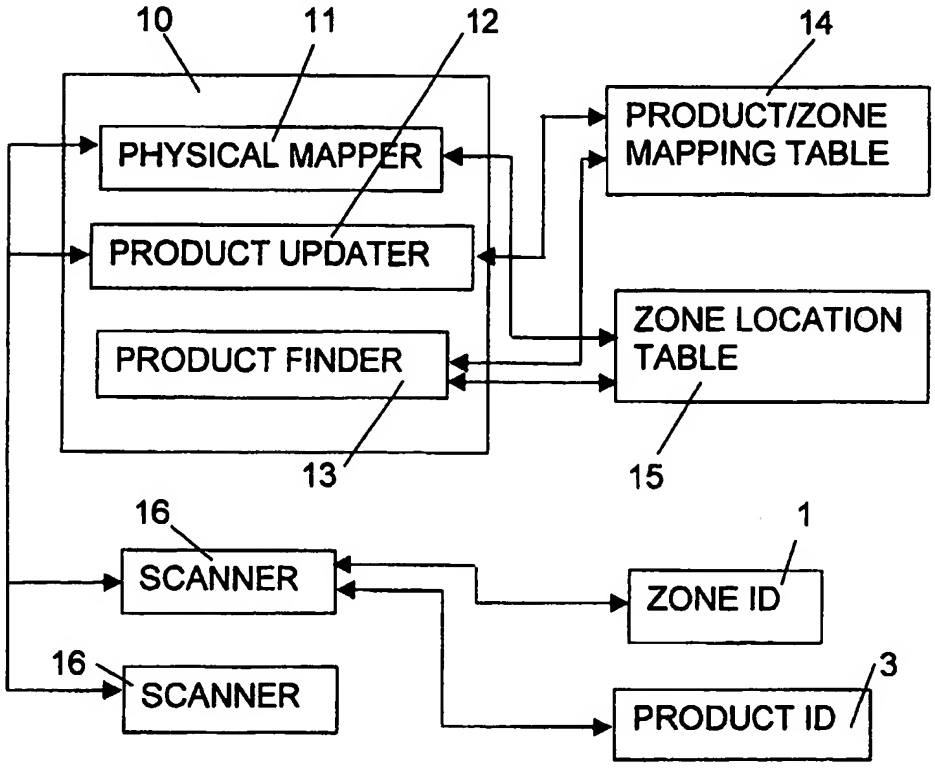
10
11
12
14
PHYSICAL MAPPER
PRODUCT/ZONE MAPPING TABLE
PRODUCT UPDATER
ZONE LOCATION TABLE
PRODUCT FINDER
13
15
16
1
SCANNER
ZONE ID
16
3
SCANNER
PRODUCT ID

FIG 2

STOCK LOCATION MANAGEMENT

This invention relates to stock location management systems and methods which permit a retail store or warehouse, or the like, to maintain and manage an accurate map of the physical location of stock (products) within in it, and in particular on its shelves.

Many retail stores now offer online shopping to their customers, whereby a customer sends a list of shopping to the store, for example via the Internet, and a member of staff picks the items off the shelves on behalf of the customer, usually prior to delivering the items to the customer's home. There are several software applications in use by retail stores for arranging the customer's shopping list into an appropriate order for picking off the shelves, that is arranging the items on the list into the order of aisle, shelf etc which a particular route around the store or part of the store will take.

However, in order for these applications to be effective, there is a requirement for an accurate store map (map of where stock is located), so as to enable the application to identify the physical location of each item on the customer's shopping list.

There are other software applications which also benefit from, or require, an accurate store map, such as a product locator application for customer use.

Within many retail stores, stock is often moved from one shelf to another, or is located in multiple locations to cater for special promotions. Conventionally there is a manual process to update the store map in these cases. However, this leads to existing store maps regularly being out of date, resulting in delays in picking a customer's shopping, or in-store pickers being unable to find items.

US Patent No. 5426284 to Doyle describes an apparatus for locating and tracking information storage items using predefined labels. Labels identify physical locations, such as an aisle, a shelf etc. Whilst this is suitable for a tape library, as described in the specification, it is unsuitable for retail stores where the configuration of the aisles, shelves etc, change frequently.

An objective of the present invention is to automate the updating of store maps in such a manner that it facilitates stock location within the store by an in-store picker or indeed by a customer.

According to one aspect of the present invention there is provided a stock location management system comprising,

a plurality of zones where stock can be located, each said zone having at least one respective identification indicator associated therewith, and the stock including a plurality of product lines, each product line having a respective identification indicator associated therewith;

means for reading the zone identification indicators and the product identification indicators;

first storage means for storing information regarding which product line is stored in which zone;

means for determining the physical location of each said zone, and

second storage means for storing physical location information for each said zone.

According to another aspect of the present invention there is provided a method for use in the management of stock comprising a plurality of product lines, including the steps of:

dividing an area where stock can be located into a plurality of zones;

associating a respective zone identification indicator with each said zone;

associating a respective product line identification indicator with each said product line;

for the or each product line disposed in each said zone, storing identification indicator information in a first storage means regarding which product line is stored in which zone;

determining the physical location of each said zone, and

storing physical location information for each said zone in second storage means.

Embodiments of the invention will now be described with reference to the accompanying drawings, in which

Fig.1 illustrates schematically a section of shelf space within a store, and
Fig.2 illustrates a system for stock location within a store.

Referring firstly to Fig.1, the shelf space in a retail store is illustrated as divided into a number of zones. The size and shape of these zones is arbitrary. Typically, each shelf within each aisle may be split into a series of zones along the lengths of the shelves or lengths of the aisles. However, alternatively, the aisle may be split into a series of vertical zones, spanning the shelves. A shelf A is illustrated as split into a number of zones A1, A2, A3 ... AX, AY ... , similarly shelves B and C can also be split into a number of zones, along the length of the aisle. Alternatively a vertical zone X can be comprised by respective portions of shelves A, B and C, that is portions AX, BX and CX.

Each zone is given a unique identifier. For example, consider shelf A split lengthwise into zones A1, A2 etc. At each end of each zone a zone identification indicator or token 1 is disposed which contains the zone identifier in a machine readable format. The indicators 1 at the ends of zone A1 both contain the zone identifier for zone A1, the indicators 1 at the ends of Zone A2 both contain the zone identifier for Zone A2, and so on. If the zone spans multiple shelves, such as zone X, the indicators 1 at both ends of each shelf all contain the zone identifier for zone X, there being six indicators 1 illustrated on shelf portions AX, BX and CX.

Thus from any physical location, a person in an aisle can follow a shelf left or right until they find a zone identification indicator which will correctly identify the zone concerned. Any product such as 2 on a shelf zone such as A1 will be associated with a product identification

indicator or token 3 on the product itself for check-out scanning purposes etc, and on the front of the part of the respective shelf zone A1 or shelf portion AX in the vicinity of where the product is or is to be put on the shelf. A store will contain a plurality of product lines, each with their own product identification indicator.

These zone identification indicators 1 and product identification indicators 3 are, typically, barcodes which can be read by portable scanning devices 16, that is to say by barcode readers.

Referring now to Fig.2, the scanning devices 16 form part of a stock location management system comprising a computer 10 which runs three applications, a Physical Mapper 11, a Product Updater 12 and a Product Finder 13. There are two database tables, a Product/Zone Mapping table 14 and a Zone Location table 15. The Product/Zone Mapping table 14 contains a list of product identification indicators together with the zone identification indicators corresponding to the zones in which they are located. The Zone Location table 15 contains a list of zone identification indicators together with information identifying the corresponding physical location within the store.

The scanning devices 16 communicate with the Product Updater application 12 and the Physical Mapper application 11. These communications preferably happen in real time using a radio frequency link or otherwise, but may also be offline, with information being stored on the scanning device and uploaded periodically to the applications 11 and 12.

After the shelves, gondolas containing shelves and zones etc have been physically positioned within the retail store, and the zone identification identifiers have been allocated to all of the zones, the initial physical location of each zone is stored using the Physical Mapper application 11. The physical location may be indicated by aisle number, shelf number, shelf position, or it may be indicated by an X-Y geographic location within the store. Preferably the physical location is input and updated by a said scanning device 16. Members of staff scan the zone identification identifiers and then enter the corresponding physical location. Alternatively, the location of the scanning device could be identified automatically using, for example, radio frequency triangulation. Thus there is obtained a Physical Store Map identifying where the

particular zones are within the store. This Physical Store Map is stored in the Zone Location table database 15.

The Product/Zone mapping table database 14 contains a list of product identification indicators and the corresponding zone identification indicators. This comprises a Product Location Map.

When a new product line is placed on a shelf, be this when the stock location management system of the invention is first set up in a store or subsequently, the Product Location Map requires input or update, in particular a member of staff has to update the Product Location Map to associate the new product line with the respective zone identification indicator.

This is done by finding the zone identification indicator, by moving left or right along the shelf until the zone indicator or token is found. This is scanned with their scanning device 16. They then return to an example of the new product line and scan its product identifier or token, barcode etc, using their scanning device 16. As a result, the scanning device records details of the zone identifier and the product identifier (code) for the new product line. This information is then communicated to the Product Updater application 12.

A similar process is also undertaken when a product line is removed from a shelf. The member of staff scans the zone identifier and the product identifier and indicates that this is a product line removal.

The Product Updater application 12 stores a list of product lines, or rather their identifiers, i.e. product codes, and the corresponding zone identifiers in the Product/Zone Mapping table database 14. A product line may be associated with multiple zone identifiers, for example there may be a plurality of entries for a product line identifier in the database, one for each possible zone identifier where the product may be disposed within the store. Typically this is required where a product line is featured in a second location as part of a special promotion.

The Product Finder application 13 is used to find the physical location of a product line. Using the product code, the Product Finder application 13 searches the Product/Zone Mapping table 14

to find the zone identifier(s) associated with the product code. The Product Finder application 13 then searches the Zone Location table 15, to determine the physical location of the or each zone identifier found.

For example, product code "ABC" may be located in zone "1234" and "6801", as detailed in the Product/Zone Mapping table 14. The Product Finder then identifies from the Zone Location table 15, that zone "1234" is located at "Aisle 6, Shelf 2, Position 9", and that zone "6801" is located at "Aisle 8, Shelf 1, Position 2". Thus it determined that product code "ABC" is located at both "Aisle 6, Shelf 2, Position 9" and "Aisle 8, Shelf 1, Position 2".

The results of the Product Finder application 13 may be fed into a store pick list application or into any other application requiring the physical location of a product.

As the zone identifiers are separate from their physical location, that is the zone identifiers do not themselves indicate where the zones physically are, it will be appreciated that zones can easily be created, merged, restructured and removed, simply by updating the Zone Location table 15. In the event that a whole gondola of shelves is moved as part of a store reorganisation or seasonal promotion, all of the zones within that gondola can be updated in one step.

Within many stores there is a daily stocktaking process, where a member of staff physically checks the stock level of each product line. The process can be changed to enable validation of the store map, in addition.

Before checking the stock levels on a shelf, the member of staff scans the zone identification indicator (barcode label or the like). Preferably the scanning device used communicates immediately with the Physical Mapper application 11, to determine the stored physical location of this zone in the Zone Location table 15, and to enable the member of staff to confirm or update this as appropriate. The member of staff then conducts the stock check as usual, scanning in the barcodes of the product lines and entering the stock levels. As each barcode is scanned in, the scanning device 16 registers the product code as being within the last zone identified. Preferably the scanning device communicates immediately with the Product Updater application

12, to verify from the Product/Zone Mapping table 14 that the product line is associated with that zone, and alerts the member of staff of any mismatches. The member of staff can then check whether they have moved out of a zone, or whether the product has been moved to or added to their current zone.

Additionally or alternatively, at some later stage the details can be uploaded from the scanning device 16 to the Product Updater 12, which can identify any changes to the product locations. These changes may be committed immediately to the Product/Zone Mapping table 14, or an exception report of location changes may be produced for further investigation.

As will be appreciated, many modifications to the above-described system may be made. For example, rather than having zone identification indicators (labels or tokens etc) on each end of a zone, they may be placed at various locations along the fronts of the shelves within a zone. When a new product line is placed on a shelf, a product label including a product identification and usually price information is placed on the shelf front. Product label holders can be provided into which these product labels can be inserted. Zone identification labels could also be inserted in these holders. Thus when a product barcode is inserted, the zone identification label and the product identification label will appear side by side. Hence, when the product label is scanned, either when the product line is first added or during stocktaking, the scanner can also scan the zone identification label. This gives the advantage that the zone identification and the product labels can be scanned in a single step, and avoids the need for the member of staff having to find the zone identification label. Similarly, when a product line is removed from a zone, the zone identification label and product barcode are scanned, product line removal indicated on the scanning device and then the product label is removed from the holder, leaving the zone identification label in it for subsequent use.

Whereas the use of barcodes has been specifically described above, the product identification indicators and/or the zone identification indicators may alternatively be radio frequency tags. The scanning device in this case will need to be capable of reading these radio frequency tags in order to identify the product or zone. A further possibility involves one or more devices built

into or attached to the zones, in order to read the radio frequency tags of the products placed within it, and capable of communicating the information back to the store computer 10.

In summary, and as will be appreciated from the above, the invention is concerned with dividing the "shelf space" available for product into a number of zones each of which has one or more identifiers associated with it. A first table is maintained of which product line is disposed at which zone. Another table is maintained which gives details of the physical location within a store of each zone. In order to locate a product line within a store, first the zone(s) in which it is positioned is determined from the first table, and then secondly the physical location of the zone(s) is determined from the other table. This permits a particular product line located at more than one position within the store to be found, permits the product to be moved to another zone and still be found, provided the first table is kept up to date, and even permits zones to be physically moved within the store and product line still found, provided the other table is kept up to date. The system and method proposed above permits a store to manage and maintain an accurate map of the physical location of stock on its shelves, this being essential to applications such as those for use with online shopping and product location systems for customers. Furthermore, the store map can be updated automatically when product lines are added to or removed from shelves, and validated as part of stock checking activities.

CLAIMS

1. A stock location management system comprising,

a plurality of zones where stock can be located, each said zone having at least one respective identification indicator associated therewith, and the stock including a plurality of product lines, each product line having a respective identification indicator associated therewith;

means for reading the zone identification indicators and the product identification indicators;

first storage means for storing information regarding which product line is stored in which zone;

means for determining the physical location of each said zone, and

second storage means for storing physical location information for each said zone.

2. A system as claimed in claim 1 and further including means for finding the physical location of a said product line by interrogation of the first storage means to determine the respective zone or zones for said product line and subsequent interrogation of the second storage means to determine the physical location thereof.

3. A system as claimed in claim 1 or claim 2, and further including means for updating the information stored in the first storage means in response to the addition of a said product line to a respective zone or the removal of a said product line from a respective zone.

4. A system as claimed in any one of claims 1 to 3 and further including means for updating the information stored in the second storage means in response to physical movement of a said zone.

5. A system as claimed in claim 3 wherein the product line updating means employs data supplied by the reading means regarding zone identification indicators and product identification indicators and input advising that the said product line is being added or removed.

6. A system as claimed in claim 4 and including stocktaking means to which is input the actual physical location of a said zone, and means to compare the actual physical location with the physical location information for said zone stored in the second storage means.

7. A system as claimed in any one of the preceding claims wherein a respective said zone identification indicator is disposed at each end of a shelf or shelf portion comprising each said zone.

8. A system as claimed in any one of claims 1 to 6, wherein a respective said zone identification indicator is disposed on a shelf front or shelf front portion of a shelf comprising each said zone.

9. A system as claimed in claim 8 wherein each said shelf front or shelf front portion includes a holder for a respective said zone identification indicator.

10. A system as claimed in claim 9 wherein the holder also contains the respective product identification indicator.

11. A system as claimed in any one of the preceding claims wherein the identification indicators are comprised by barcodes and the reading means comprises a portable scanner.

12. A system as claimed in any one of claims 1 to 10, wherein the identification indicators are comprised by Radio Frequency Tags.

13. A stock location management system substantially as herein described with reference to and as illustrated in the accompanying drawings.

14. A method for use in the management of stock comprising a plurality of product lines, including the steps of:

dividing an area where stock can be located into a plurality of zones;

associating a respective zone identification indicator with each said zone;

associating a respective product line identification indicator with each said product line;

for the or each product line disposed in each said zone, storing identification indicator information in a first storage means regarding which product line is stored in which zone;

determining the physical location of each said zone, and

storing physical location information for each said zone in second storage means.

15. A method as claimed in claim 14 and wherein for finding the physical location of a said product line, including the steps of

interrogating the first storage means to determine the respective zone or zones for said product line, and

interrogating the second storage means to determine the physical location of the said respective zone or zones.

16. A method as claimed in claim 14 or claim 15, including the steps of updating the information stored in the first storage means in response to the addition of a said product line to a respective zone, or the removal of a said product line from a respective zone.

17. A method as claimed in claim 16 wherein the identification indicators are readable by reading means, and including the steps of employing said reading means to read the zone and product line identification indicators of said product lines to be added or removed, and inputting the read indicator information to said first storage means via said reading means, together with an indication that addition or removal is required.

18. A method as claimed in any one of claims 14 to 17, including the step of updating the physical location information stored in the second storage means in response to physical movement of a said zone.

19. A method as claimed in claim 18 as appendant to claim 17 and including performing a stocktaking process comprising determining the actual physical location of a said zone, prior to reading the zone and product line identification indicators, comparing the actual physical location with the physical location information stored in the second storage means for the read zone and product identification indicators, and changing the physical location stored information if appropriate.

20. A method for use in the management of stock comprising a plurality of product lines, substantially as herein described with references to and as illustrated in the accompanying drawings.

Amendments to the claims have been filed as follows

1. A stock location management system for stock including a plurality of product lines, the system comprising:

(a) storage means comprising a plurality of zones, each zone having at least one machine-readable label identifying the zone;

(b) a plurality of machine-readable labels identifying the product lines;

(c) a computerised database comprising a first database table, indicating the zone in which each of the product lines is stored, and a second database table indicating the physical location of each of the zones;

(d) at least one scanning device for scanning the labels identifying the zones and the product lines and for updating the first database table in accordance with the results of the scanning; and

(e) computer processing means for interrogating the database tables to find the physical location of any desired product line.

2. A system according to claim 1 wherein the storage means comprises a plurality of shelves.

3. A system according to claim 2 wherein the machine-readable labels are attached to the shelves.

4. A system according to any preceding claim wherein the machine-readable labels are bar code labels, and wherein the scanning device comprises a portable bar-code scanner.

5. A system according to any preceding claim wherein the physical location of each zone is indicated at least in terms of an aisle number and a position within the aisle.

6. A system according to any preceding claim wherein the labels identifying the product lines are positioned side-by-side with the labels identifying the zones, allowing the label identifying a product line and the label identifying zone in which that product line is stored to be scanned in a single step.

7. A system according to any preceding claim including computer processing means for generating a pick list indicating the physical locations of a plurality of desired product lines.

8. A stock location management system substantially as hereinbefore described with reference to the accompanying drawings.

9. A stock location management method for stock including a plurality of product lines stored in a storage means, the method comprising the steps:

(a) dividing the storage means into a plurality of zones and labelling each zone with at least one machine-readable label identifying the zone;

(b) labelling each product line with a machine-readable label identifying the product line;

(c) maintaining a computerised database comprising a first database table, indicating the zone in which each of the product lines is stored, and a second database table indicating the physical location of each of the zones;

(d) using a scanning device to scan the labels identifying the zones and the product lines and updating the first database table in accordance with the results of the scanning; and

(e) operating computer processing means to interrogate the database tables to find the physical location of any desired product line.

10. A method according to claim 9 wherein the storage means comprises a plurality of shelves.

11. A method according to claim 10 wherein the machine-readable labels are attached to the shelves.

12. A method according to any of claims 9-11 wherein the machine-readable labels are bar code labels, and wherein the scanning device comprises a portable bar-code scanner.

13. A method according to any of claims 9-12 wherein the physical location of each zone is indicated at least in terms of an aisle number and a position within the aisle.

14. A method according to any of claims 9-13 wherein the labels identifying the product lines are positioned side-by-side with the labels identifying the zones, allowing the label identifying a product line and the label identifying zone in which that product line is stored to be scanned in a single step.

15. A method according to any of claims 9-14 including operating computer processing means to generate a pick list indicating the physical locations of a plurality of desired product lines.

16. A stock location management method substantially as hereinbefore described with reference to the accompanying drawings.